

**DRAFT RESTORATION PLAN and ENVIRONMENTAL ASSESSMENT**

for the  
**BUFFALO RIVER,**  
**BUFFALO, NEW YORK**



**September 2019**

*Prepared by:*

United States Fish and Wildlife Service

on behalf of the

**U.S. Department of the Interior, Tuscarora Nation**

**and**

**New York State Department of Environmental Conservation**

## Executive Summary

In 2009, the United States Department of the Interior, acting through the United States Fish and Wildlife Service, the Tuscarora Nation, and the State of New York, acting through the New York State Department of Environmental Conservation, collectively the Trustees, published a Notice of Intent (NOI) to pursue a natural resource damage claim against Potentially Responsible Parties (PRPs) for the Buffalo River located in the City of Buffalo, Erie County, New York. The Trustees are currently considering entering into a negotiated settlement with some PRPs in which some of these PRPs would acquire conservation easements and restrictions on specific properties and/or make monetary payments to the Trustees to fund restoration work and to reimburse the Trustees for past assessment costs.

The Trustees are required to use settlement funds to compensate the public by restoring injured natural resources and supporting habitat, and/or services provided by the injured resources. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) requires that before settlement monies can be used for restoration activities, the Trustees must develop and adopt a restoration plan and provide for adequate public notice, opportunity for hearing, and consideration of all public comments. Accordingly, the Trustees prepared and distributed a NOI to prepare a Draft Restoration Plan and Environmental Assessment (RP/EA) for the Buffalo River, New York, on December 8, 2017, and sought public comment. The Trustees requested public input in identifying specific restoration project ideas to assist the Trustees in the development of this Draft RP/EA which incorporates the public comments received during the December 8, 2017, through February 9, 2018, public comment period.

The Draft RP/EA explains the considerations and criteria for identifying and evaluating restoration alternatives followed by descriptions of the proposed and preferred restoration alternatives. After significant and meaningful consultation with the public, local communities, and other interested stakeholders, State and Federal stream and wetland restoration experts, and restoration project proponents, and after evaluating and considering the proposed restoration alternatives under the CERCLA Natural Resource Damage Assessment and Restoration (NRDAR) regulations and all other relevant State and Federal laws and policies, the Trustees have proposed their preferred restoration alternative. The Trustees proposed preferred restoration alternative is implementation of a suite of restoration projects that compensate for losses and satisfy the site-specific and regulatory criteria from the following restoration categories: instream and stream bank, wetland, and upland enhancement and restoration, land preservation, and natural resource-based public use enhancement.

The Trustees have identified and incorporated into the Draft RP/EA specific restoration projects to be implemented from within the above restoration categories. All of the restoration projects are described below and are presented in the priority order that the Trustees propose to implement them at this time, should funding become available for such work. Depending on the settlement outcome, this prioritization is subject to change, at the Trustees discretion, should the Trustees evaluation of the relevant factors change. The preferred alternative restoration projects include: conservation easement and habitat restoration at Concrete Central Peninsula, City Ship Canal, and Houghton Park and the Upstream City of Buffalo parcels; Natural Resource-Based Public Use Enhancement; Buffalo River Watershed Invasive Plant Species Management; conservation easements and habitat restoration at South Buffalo Charter School, Niagara Frontier

Transit Authority, and Silo City (see Section 3.1, Alternative 1 (Preferred Alternative) below for a more detailed description of the projects).

The Trustees may implement restoration projects from restoration categories that are not specifically identified in this draft RP/EA, but are similar to those restoration categories identified and consistent with our restoration requirement under CERCLA to use settlement funds to compensate the public by restoring injured natural resources and supporting habitat, and/or services provided by the injured resources. The need to implement restoration projects beyond the draft RP/EA preferred restoration alternative may arise from: 1) the inability to achieve restoration goals by implementing projects solely within identified categories, or 2) a determination that a future action and/or project outside of the identified categories is more appropriate at meeting restoration goals based on application of the site-specific and regulatory criteria, as discussed below in Section E.1. In the event of a significant modification to the RP/EA, the Trustees will provide the public with an opportunity to comment on that particular modification and will be finalized before any modifications will be implemented.

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## A. Introduction

The Buffalo River is one of the 43 Areas of Concern (AOC) within the Great Lakes, so designated because they are considered to be severely degraded geographic areas, primarily due to contaminated sediment and point and non-point source pollution, within the Great Lakes Basin. They are specifically identified in the 1987 Great Lakes Water Quality Agreement (GLWQA) between the United States and Canada as “geographic areas that fail to meet the general or specific objectives of the Agreement, where such failure has caused or is likely to cause impairment of beneficial use of the area’s ability to support aquatic life.” The objectives of the GLWQA were not being met and remedial actions were determined necessary to restore or protect beneficial uses. The Buffalo River historically experienced heavy industrial development in a growing municipality. It has been severely impaired by past industrial and municipal discharges of polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), mercury, lead, and other hazardous substances.

In response to the contaminated sediment, the Buffalo River Restoration Partnership, including the United States Environmental Protection Agency (USEPA), United States Army Corps of Engineers (USACE), New York State Department of Environmental Conservation (NYSDEC), the City of Buffalo, Buffalo Niagara Waterkeeper (Waterkeeper), and Honeywell International, Inc. (Honeywell), developed plans for a comprehensive cleanup that included two major environmental dredging projects (NYSDEC 2019). The first environmental dredging project, Phase 1, begun by USACE in 2011 removed an estimated 550,000 cubic yards of contaminated sediments in the federal navigation channel using USACE and Great Lakes Restoration Initiative (GLRI) funds. The second environmental dredging project, Phase 2, begun by USEPA (under the Great Lakes Legacy Act [GLLA]), the Waterkeeper, and Honeywell in 2013 was a cost-share funding agreement. Phase 2 removed approximately 453,000 cubic yards of contaminated sediment outside of the navigation channel, included capping of 50,000 cubic yards of contaminated sediment within the City Ship Canal, and the creation/restoration of 8 acres of aquatic habitat in the Buffalo River. These remedial actions, while beneficial, do not themselves compensate the public for past, present, and future contaminant-related injuries to natural resources.

Under Federal law, natural resource trustees are authorized to act on behalf of the public to assess and recover natural resource damages, and to plan and implement actions to restore, replace, rehabilitate, or acquire the equivalent of injured natural resources and resource services lost due to the release of hazardous substances (Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 United States Code (USC) §§ 9601, et seq., Natural Resource Damage Assessment and Restoration (NRDAR) regulations, 43 Code of Federal Regulations (CFR) Part 11). In 2009, the United States Department of the Interior (DOI), acting through the United States Fish and Wildlife Service (Service), the Tuscarora Nation, and the State of New York, acting through the NYSDEC, collectively the Trustees, published a Notice of Intent (NOI) to pursue a natural resource damage claim against Potentially Responsible Parties (PRPs) for the Buffalo River located in the City of Buffalo, Erie County, New York.

The Trustees are currently developing a negotiated settlement with the PRPs in which the PRPs would acquire conservation easements or restrictions on specific properties and make monetary payments to the Trustees to fund restoration work and to reimburse the Trustees for past assessment costs. Under CERCLA, the Trustees are required to use settlement funds to compensate the public by restoring injured natural resources and supporting habitat, and/or services provided by the injured resources. CERCLA requires that before settlement monies can be used for restoration work, the Trustees must develop and adopt a restoration plan and provide for adequate public notice, opportunity for hearing, and consideration of all public comments. Accordingly, the Trustees prepared and distributed a NOI to prepare a Draft Restoration Plan and Environmental Assessment (RP/EA) for the Buffalo River, New York, on December 8, 2017, and sought public comment. The Trustees requested public input in identifying specific restoration project ideas to assist the Trustees in the development of this Draft RP/EA which incorporates the public comments received during the December 8, 2017, through February 9, 2018, public comment period.

The Trustees prepared this Draft RP/EA pursuant to their authorities and responsibilities under CERCLA, the Federal Water Pollution Control Act, 33 USC § 1251, et seq. (also known as the Clean Water Act), and other applicable Federal laws, including Subpart G of the National Oil and Hazardous Substances Contingency Plan, at 40 CFR §§ 300.600 through 300.615, and DOI's CERCLA NRDAR regulations, which provide guidance for this restoration planning process under CERCLA. The Buffalo River Draft RP/EA includes criteria and guidance the Trustees used in selecting, with public input, specific feasible restoration projects that might be included in or funded by a settlement and that will maximize the benefits to the affected resources in the Buffalo River. As part of such criteria and guidance, the Trustees are required to ensure that the selected restoration actions are feasible, safe, and cost-effective, and that they address injured natural resources, consider actual and anticipated conditions, have a reasonable likelihood of success, and are consistent with applicable laws and policies. The proposed selected restoration actions also must not conflict with the ongoing cleanup projects. Additional criteria for evaluation of suggested projects include proximity to injured natural resources within the Buffalo River, increased habitat connectivity, and relationship to local or regional conservation plans.

## **B. Background**

The Buffalo River is formed by the confluence of Buffalo Creek and Cayuga Creek in Buffalo, New York, and is approximately 8.7 miles long (Figure 1). Additional source water is supplied by a third tributary, Cazenovia Creek, which flows into the Buffalo River downstream of the confluence with Cayuga Creek. The Buffalo River flows through the City of Buffalo, discharging into Lake Erie at the head of the Niagara River. The City Ship Canal forms a spur of aquatic habitat that stretches approximately 1.4 miles from the mouth of the Buffalo River south to the Tifft Nature Preserve (Figure 1). The City Ship Canal was originally constructed in 1850, widened in 1873, and lengthened in 1883 (Buffalo Niagara Riverkeeper 2005). The Buffalo River and the City Ship Canal serve as important habitat for warmwater fish, migratory birds, and other wildlife. The Buffalo River is also a significant cultural site of the Haudenosaunee and is the location of the former Buffalo Creek Reservation.



Figure 1. Buffalo River, City Ship Canal, and Times Beach Nature Preserve, Buffalo, New York

The Buffalo River flows through the lands formerly encompassed by the Buffalo Creek Reservation and is a significant cultural site of the Haudenosaunee<sup>1</sup> in western door territory. Evidence of Native American habitation along the Buffalo Creek dates as far back as the Neolithic period, and the Seneca people held the first significant human settlement of the area (Houghton 1920). The name for the place is Dosyowa, or the place of the basswood tree. The Haudenosaunee settlement at Buffalo Creek contained lowland forests and wetlands along the floodplains of Buffalo, Cayuga, and Cazenovia Creeks, which supported an abundant variety of aquatic and terrestrial life. The soil in this area was especially fertile and the site is where the message of Handsome Lake to revitalize farming began (Patterson 2010).

The area took on greater importance for the Haudenosaunee after the American Revolutionary War. During that war, many Haudenosaunee villages were destroyed and the area along Buffalo Creek was one of three main regions where displaced Haudenosaunee People relocated (Patterson 2007). The Buffalo Creek Reservation was formally established in 1797. At its largest size, it encompassed 130 square miles of land, on both sides of the Buffalo River, stretching eastward from Lake Erie, including what is now the southeastern portion of the City of Buffalo. Key Haudenosaunee leaders with connections to Buffalo Creek include Handsome Lake, Cornplanter, and Red Jacket (who is buried there).

A series of treaties were signed between the Haudenosaunee and Federal and State governments at the Buffalo Creek Reservation (Seneca Nation of Indians 2018). The 1838 Buffalo Creek Treaty and the subsequent 1842 Compromise Treaty at Buffalo Creek resulted in the loss of the Buffalo Creek Reservation for the Haudenosaunee. Nevertheless, expatriated Haudenosaunee People continued to hunt and fish in the area and to visit the graves of their ancestors (Houghton 1920), and Dosyowa remains an important cultural place for the Haudenosaunee to

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<sup>1</sup> Haudenosaunee (“People of the Longhouse”), also known as the Iroquois Confederacy, is comprised of the Mohawk, Oneida, Onondaga, Cayuga, Seneca, and Tuscarora Nations. The Tuscarora Nation serves as Trustee on behalf of the Haudenosaunee and the cultural restoration proposals for the Buffalo River were developed by the Haudenosaunee Environmental Task Force (HETF).

this day. Many ancestors of the Haudenosaunee People who lived and died at Buffalo Creek are concerned about how the land and the resources are being treated in their homelands.

The Buffalo River and City Ship Canal have been a historical center of shipping commerce, and as a result, much of the shoreline is industrialized and channelized. The Buffalo River is maintained by the USACE as a navigable waterway, with dredging operations conducted periodically in the lower 5.8 miles of the River to maintain minimal depths for navigation (USACE 1976, Sargent 1975). The industrial development along the Buffalo River and growing municipality resulted in contamination of the Buffalo River and City Ship Canal with hazardous substances including PAHs, PCBs, dichlorodiphenyltrichloroethane (DDT), arsenic, cadmium, chromium, copper, mercury, nickel, lead, zinc, aniline, benzene, toluene, ethylbenzene, and xylene (BTEX), phenols, and oil.

This Draft RP/EA also addresses injury to natural resources in the Times Beach Nature Preserve (Figure 1). Historically, dredged materials from the Buffalo River were disposed of in Lake Erie (open water disposal). However, in 1967, the USACE was prohibited from disposing of Buffalo River sediments in Lake Erie because of contamination (Sweeney 1973). Therefore, in 1971, the Times Beach Confined Disposal Facility (TBCDF) was constructed and the USACE began disposing of dredged materials from the Buffalo River into that facility. Continual deposition of sediment led to the creation of 46 acres of both aquatic and terrestrial habitat, and the site was rapidly colonized by various plant and animal species (Stafford *et al.* 1991). At the request of the Buffalo Ornithological Society, the USACE abandoned the TBCDF as a disposal site in 1976, and 15 years later it was designated a nature preserve, Times Beach Nature Preserve; it is owned by the City of Buffalo (Buffalo Niagara Riverkeeper 2005, Stafford *et al.* 1991). As a result of years of contaminated sediment disposal in the TBCDF and subsequent biological colonization, plants and resident and migratory animals have been exposed to the suite of contaminants found in Buffalo River sediment.

### **C. Natural Resources of the Buffalo River**

The Buffalo River is an important ecological, cultural, historical, and economic natural resource. Buffalo River resource values/uses include fish and wildlife habitat, significant cultural and historical site, recreation, industrial uses, transportation and navigation, and sanitation. Stressors to this important resource that result in excess nutrient, sediment, and contaminant input to the Buffalo River include: hydrologic and habitat modifications, upstream agricultural runoff, historic industrial input, stormwater runoff, and inadequate water treatment. Local, State, and Federal entities are working to restore and preserve the Buffalo River as an important resource as noted by the numerous conservation and restoration plans (Exhibit 1) and recently completed habitat non-NRDAR restoration projects (Figure 2):

### Exhibit 1. Buffalo River Conservation and Restoration Plans

- Buffalo River Area of Concern Remedial Action Plans (NYSDEC 1989, 1990, 1991, 1992, 1993, 1995, 1999, 2002, Buffalo Niagara Riverkeeper 2005, 2008, 2011, 2013, and 2014a).
- Buffalo River Greenway Plan and Design Guidelines (City of Buffalo 1996).
- Buffalo River Greenway Vision and Implementation Plan (Buffalo Niagara Riverkeeper 2006).
- Buffalo and Niagara Rivers Habitat Assessment and Conservation Framework (Buffalo Niagara Riverkeeper 2008).
- Buffalo River Ecological Restoration Master Plan (USEPA 2011).
- Niagara River Habitat Conservation Strategy (Buffalo Niagara Riverkeeper 2014b).
- City of Buffalo Land Use Plan and Green Code Unified Development Ordinance (City of Buffalo 2016a, b).
- City of Buffalo Draft Local Waterfront Revitalization Program (City of Buffalo 2017).
- Regional Niagara River/Lake Erie Watershed Management Plan (Buffalo Niagara Riverkeeper and NYS Department of State 2017).
- Draft Restoration Plan and Environmental Assessment for the Buffalo River, Buffalo New York (this restoration plan).



Figure 2. Recently Completed Habitat Restoration Projects, Buffalo River, New York

The Buffalo River, City Ship Canal, and Times Beach Nature Preserve serve as important habitat for warmwater fish, migratory birds, and other wildlife. The Buffalo River warmwater fishery includes species such as smallmouth bass (*Micropterus dolomieu*), largemouth bass (*Micropterus salmoides*), brown bullhead (*Ameiurus nebulosus*), carp (*Cyprinus carpio*), northern pike (*Esox lucius*), muskellunge (*Esox masquinongy*), walleye (*Sander vitreus*), yellow perch (*Perca flavescens*), and white sucker (*Catostomus commersonii*).

Confirmed breeding bird species include Cooper's hawk (*Accipiter cooperii*), red-tailed hawk (*Buteo jamaicensis*), great horned owl (*Bubo virginianus*), belted kingfishers (*Megacyrle alcyon*), black duck (*Aythya rubripes*), mallard (*Anas platyrhynchos*), wood duck (*Aix sponsa*), spotted sandpiper (*Actitis macularia*), red-bellied, downy, and hairy woodpeckers (*Melanerpes carolinus*, *Dryobates pubescens*, *Dryobates villosus*), and a variety of songbirds including swallows, wrens, and warblers (Applied Ecological Services, Inc. [AES] 2013). Osprey (*Pandion haliaetus*), a New York State species of "special concern," are known to feed at the mouth of the Buffalo River. Common terns (*Sterna hirundo*) and pied-billed grebes (*Podilymbus podiceps*), New York State listed "threatened" species, and peregrine falcons (*Falco peregrinus*) and black terns (*Chlidonias niger*), New York State listed "endangered" species, were observed along the Buffalo River in 2012 (AES 2013). Shorebirds, herons, rails, and other marsh birds are found along the Buffalo River, City Ship Canal, and Times Beach Nature Preserve in wetlands and mudflats. Over 240 species of breeding and migrating birds, in addition to pollinators such as bees, damselflies, dragonflies, and butterflies, and herpetofauna and mammalian species utilize the Times Beach Nature Preserve (Friends of Times Beach Nature Preserve 2018).

A variety of herpetofauna and mammalian species utilize the habitat along the Buffalo River, City Ship Canal, and Times Beach Nature Preserve. A 2012 wildlife survey conducted within the Buffalo River AOC (AES 2013) noted twelve herpetofauna species and twenty mammalian species including four Species of Greatest Conservation Need (NYSDEC 2015): short-headed garter snake (*Thamnophis brachystoma*), eastern spiny softshell turtle (*Apalone spinifera*), eastern red bat (*Lasiurus borealis*), and hoary bat (*Lasiurus cinereus*).

As noted previously, the Buffalo River is a tributary of the Niagara River. The Niagara River serves as important habitat for warmwater and coldwater fish, migratory birds, and other wildlife. The Niagara River Corridor is an Audubon Global Important Bird Area (National Audubon Society 2013), known worldwide for its spectacular concentrations of migrating gulls and diversity and abundance of waterfowl. The Niagara River supports an interjurisdictional fishery and is heavily utilized for recreational purposes such as boating, fishing, and bird-watching.

An application nominating the Niagara River, New York, as a Ramsar Convention Wetland of International Importance was submitted to the Service in January 2019. The Niagara River, New York, meets the definition of wetland as defined under the Convention and meets eight of the nine Ramsar global criteria, which pertain to representative, rare, or unique wetland types, conserving biological diversity, waterbirds, fish, and other taxa. Ramsar designation supports local and regional efforts to promote jobs, recreation, education, and conservation within the Niagara River region.

## **D. Natural Resource Damage Assessment and Restoration Process**

As noted previously, under Federal law, natural resource Trustees are authorized to act on behalf of the public to assess injury and recover natural resource damages, and to plan and implement actions to restore, replace, rehabilitate, or acquire the equivalent of injured natural resources and resource services lost due to the release of hazardous substances. Following the CERCLA NRDAR regulations, the Trustees developed a Preassessment Screen determination for the Buffalo River in Buffalo, New York, in 2008 (DOI, Tuscarora Nation, and State of New York 2008). The Preassessment Screen determination concluded that due to releases of hazardous substances and oil into the Buffalo River that natural resources under Trusteeship have been or are likely to have been adversely affected and injured. In January 2009, the Trustees published a NOI to pursue a natural resource damage claim against PRPs for the Buffalo River located in the City of Buffalo, Erie County, New York. In October 2009, the Trustees, and the PRPs, Honeywell, and Exxon Mobil Corporation (Exxon), entered into a Cooperative Agreement by which Honeywell and Exxon agreed to participate and provide funding for the performance of a cooperative NRDAR process. In 2012, Exxon withdrew from the Cooperative Agreement and agreed to indemnify Honeywell for Exxon's responsibilities related to the site pursuant to the terms of separate agreement with Honeywell. Honeywell has continued its cooperative engagement in the NRDAR process with the Trustees. During this time, the Trustees assessed and quantified injury in order to identify restoration projects intended to compensate the public for injuries to natural resources of the Buffalo River.

### *Natural Resource Injury and Service Losses*

The Buffalo River has been severely contaminated with hazardous substances from past industrial and municipal discharges. These hazardous substances include PAHs, PCBs, arsenic, cadmium, chromium, copper, mercury, nickel, lead, zinc, aniline, BTEX, phenols, and oil. To address the sediment contamination, the Buffalo River Restoration Partnership undertook two major environmental dredging projects (NYSDEC 2019). The first environmental dredging project, Phase 1, removed an estimated 550,000 cubic yards of contaminated sediments from the federal navigation channel. The second environmental dredging project, Phase 2, removed approximately 453,000 cubic yards of contaminated sediment outside of the navigation channel, with targeted removal depths to clay or glacial till. In addition, approximately 50,000 cubic yards of contaminated sediment within the City Ship Canal were capped to isolate contamination.

An estimated 323 acres of the Buffalo River, City Ship Canal, and Times Beach Nature Preserve have been contaminated by hazardous substances. Injury, as defined by the NRDAR regulations (43 CFR §11.62), to surface water resources (including sediment), fishery resources, and groundwater resources from hazardous substances has occurred. Ecological injuries in the assessment area are then quantified based on lost resource services (43 CFR §11.70). Services are "the physical and biological functions performed by the resource including the human uses of those functions. These services are the result of the physical, chemical, or biological quality of the resource." (43 CFR §11.14 (nn)). A reduction in the ability of a resource to provide these services, as compared to the baseline level of services, is considered a service loss. This loss incorporates injury over the geographic and temporal scope.

### *Ecological Losses*

The Trustees determined injury to surface water by comparing Buffalo River surface water contaminant concentrations of lead, zinc, and oil (Atkinson *et al.* 1994, NYSDEC 2005, Sutton 2006, and USEPA 2007) to ambient Aquatic Life Water Quality Criteria (ALWQC) promulgated by USEPA (2008) and the New York State narrative water quality standard for oil (NYSDEC 2008). Lead and zinc surface water concentrations exceeded ALWQC and exceedances of these criteria are an injury to surface water. For oil, New York State regulations dictate that “no residue attributable to sewage, industrial wastes or other wastes, nor visible oil film nor globules of grease” are permissible in certain classified waters, including class “C” waters. Oil spills and the presence of oil sheens have been documented in the Buffalo River, which is classified as a class “C” river, constituting an injury to surface water (NYSDEC 2008a, Roux Associates 2007).

Injury to sediment is defined as a component of injury to surface water resources (43 CFR §11.14) and to demonstrate injury to sediment in the River, the Trustees compared contaminant concentrations to sediment quality guidelines (SQGs). Although no promulgated criteria for contaminant concentrations in sediment exist, published SQGs calculate thresholds below which adverse (i.e., toxic) effects to sediment-dwelling organisms are unlikely to occur (e.g., threshold effects concentration), and above which adverse effects are expected to occur (e.g., probable effects concentration; PEC; MacDonald *et al.* 2000). Sediment contaminant concentrations of PAHs, PCBs, and metals exceeded the PEC threshold SQGs, indicating harmful effects are expected to occur to benthic organisms and this is an injury to sediment resources in the River.

The Trustees quantified losses to benthic organisms by comparing SQGs (MacDonald *et al.* 2000) to Buffalo River, City Ship Canal, and Times Beach Nature Preserve sediment contaminant concentrations of PAHs, PCBs, total DDT, and metals from published articles and reports<sup>2</sup> and site-specific toxicity testing. Sediment toxicity tests conducted in the late 1980s indicated that benthic macroinvertebrates experienced significant adverse effects when exposed to sediment and sediment porewater from the Buffalo River, effects including reduced survival, growth, reproduction, and increased incidence of morphological deformities (Litten 1987, Ingersoll *et al.* 1993, Ankley *et al.* 1996). Sediments were also found to be cytotoxic and mutagenic to multiple bacterial species, even when diluted (Papoulias and Buckler 1996). In 2007, exposure to surficial whole sediment was shown to inhibit growth of benthic invertebrates (Geotech 2007).

Ecological injury to fish was demonstrated and ecological losses quantified based on the prevalence of fish deformities, lesions, and tumors and comparisons of contaminant concentrations in fish tissue to relevant toxicity thresholds (injuries per regulatory guidance under CERCLA). Site-specific fish surveys have documented a high degree of deformities, tumors, and lesions in fish from the Buffalo River (Hirethota 1992, Kozuchowski *et al.* 1994, Irvine *et al.* 2005, and Blazer *et al.* 2009). A survey conducted in 2003-2004 (Irvine *et al.* 2005) noted a range in the prevalence of deformities, tumors, and lesions among species, with a low of

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<sup>2</sup> Buffalo River, City Ship Canal, and Times Beach Nature Preserve published articles and reports: Pethybridge 1981, Folsom 1982 (as cited in Stafford *et al.* 1991), Kuntz 1984, Rockwell *et al.* 1984, Kuzia and Black 1985, Marquenie *et al.* (1987), Aqua Tech 1989, Ingersoll *et al.* 1993, Mann-Klager *et al.* 1993, Dial 1994, SAIC 1995, Averett *et al.* 1996, Engineering and Environment 1996, Karn *et al.* 2003, NYSDEC 2006, NYSDEC 2008b, and CH2M Hill and Ecology and Environment 2009.

14% in pumpkinseed to a high of 87% in brown bullhead, and an overall Buffalo River prevalence of 37%.

Concentrations of PCBs in carp, spottail shiner, bluntnose minnow, brown bullhead, and pumpkinseed from the Buffalo River are available for the years 1983-1985, 1991, 1997, 2003, and 2004; and range from 0.02 to 15 mg/kg on a whole body wet weight basis. The average fish tissue PCB concentration across all Buffalo River and City Ship Canal fish species between 1981 and 2004 was 3.39 mg/kg wet weight on a whole body basis. Specifically, at approximately 3.4 mg/kg of PCBs, wet weight whole body, the following adverse effects have been documented to occur in relevant fish species (Table 1).

Table 1. Summary of Toxicological effects thresholds associated with tissue concentrations of PCBs in various fish species

ENDPOINT	PCB TISSUE CONCENTRATION: ONSET OF EFFECT (MG/KG WET WEIGHT)	EFFECT (SPECIES: EFFECT: PCB CONCENTRATION IN MG/KG WET WEIGHT)
Biochemical	0.28 - 10	Rainbow trout ( <i>Oncorhynchus mykiss</i> ): lowered aryl hydrocarbon hydroxylase levels: 0.29 (Janz and Metcalfe 1991) Coho salmon ( <i>Oncorhynchus kisutch</i> ) and Channel catfish ( <i>Ictalurus punctatus</i> ): increased thyroid hormone levels: 0.28 and 0.3, respectively (Mayer <i>et al.</i> 1977) Bluegill ( <i>Lepomis macrochirus</i> ): inhibition of magnesium adenosine triphosphatase: 0.6 (Desaiyah <i>et. al</i> 1972) Barbel <sup>1</sup> ( <i>Barbus barbus</i> ), Walleye ( <i>Stizostedion vitreum</i> ), and Mummichog ( <i>Fundulus heteroclitus</i> ): Ethoxyresorufin-O-deethylase induction: 0.5, 4.6, and 10, respectively (Gallagher <i>et al.</i> 1995, Hugla and Thome 1999, Barron <i>et al.</i> 2000)
Behavioral	1.6 - 3.0	Minnows ( <i>Phoxinus phoxinus</i> ): behavioral changes: 1.6 (Bengtsson 1980) Rainbow trout: showed aggression and hyperexcitability: 2.3 (Bengtsson 1980, Nestel and Budd 1975) Atlantic salmon ( <i>Salmo salar</i> ): impaired ability to avoid predators: 3.0 (Fisher <i>et al.</i> 1994)
Physiological	0.5 - 10	Arctic char ( <i>Salvelinus alpinus</i> ): increased fin erosion and liver lipid levels: 0.5 (Jorgensen <i>et al.</i> 1999) Rainbow trout : physical changes in liver, spleen, and kidney, and changes in skin pigmentation: 1.3 (Nebeker <i>et al.</i> 1974, Nestel and Budd 1975); moderate to severe erosion of dorsal fin: 10 (Thuvander and Carlstein 1991) Barbel <sup>1</sup> : liver changes: 2.6 (Hugla and Thome 1999) Walleye: greater incidence of tumors and preneoplastic lesions: 4.6 (Barron <i>et al.</i> 2000)
Growth	0.34 - 7.1	Topminnow ( <i>Fundulus</i> species): decreased growth: 0.34 (Matta <i>et al.</i> 2001) Salmon/Trout ( <i>Salmonid</i> species): decreased growth: 1.0 (Mac and Seelye 1981, Monosson 1999, Meador <i>et al.</i> 2002) Minnows: decreased F1 generation growth: 1.3 (Matta <i>et al.</i> 2001) Winter flounder ( <i>Pleuronectes americanus</i> ): decreased growth: 7.1 (Black <i>et al.</i> 1998)

ENDPOINT	PCB TISSUE CONCENTRATION: ONSET OF EFFECT (MG/KG WET WEIGHT)	EFFECT (SPECIES: EFFECT: PCB CONCENTRATION IN MG/KG WET WEIGHT)
Reproduction	0.2 – 15	<p>Starry Flounder (<i>Platichthys stellatus</i>): decreased reproduction: 0.2 (Spies <i>et al.</i> 1985)<sup>2</sup></p> <p>Lake trout (<i>Salvelinus namaycush</i>): decreased reproduction: 0.31 (Mac and Edsall 1991)<sup>2</sup></p> <p>Topminnow (<i>Fundulus</i> species): decreased larval survival: 0.34 (Matta <i>et al.</i> 2001)</p> <p>Barbel<sup>1</sup>: reduced fecundity: 0.5 (Hugla and Thome 1999)</p> <p>Chinook salmon (<i>Oncorhynchus tshawytscha</i>): decreased reproduction (40 to 90 % decrease in hatching): 3.5 (Ankley <i>et al.</i> 1991)<sup>2</sup></p> <p>Salmon/TROUT (<i>Salmonid</i> species): decreased larval survival: 5.0 (Monosson 1999)</p> <p>Sheepshead minnow (<i>Cyprinodon variegates</i>): 70 to 97 % decreased fry survival: 11 (Hansen <i>et al.</i> 1974)</p> <p>Fathead minnow (<i>Pimephales promelas</i>): 60 to 100 % decrease in fecundity and frequency of reproduction: 13.7 (USACE 1988)</p> <p>Minnow: inhibition of spawning: 15 (Bengtsson 1980)</p>
Survival	0.28 – 5	<p>Trout (<i>Oncorhynchus</i> species): decreased survival when combined with other toxicants as an additive to a mixture: 0.28 (Bills <i>et al.</i> 1981)</p> <p>Trout (<i>Oncorhynchus</i> species): doubling of mortality rate: 5 (Mac and Seelye 1981)</p>
<p>Notes</p> <p>1. Concentrations converted from dry weight basis to wet weight basis using 80% moisture content (USACE 1992).</p> <p>2. Concentration reported in eggs and converted to whole body concentration using a whole body:egg ratio of 1:1 (Russell <i>et al.</i> 1999, Niimi 1983).</p>		

The Trustees determined injury to groundwater by comparing groundwater concentrations of hazardous substances at selected sites adjacent to the Buffalo River (Industrial Economics, Incorporated, (IEc) 2014) to the New York State Codes Rules and Regulations (NYCRR) (6 NYCRR Part 703) groundwater quality standards, or New York State guidance values for Class GA fresh groundwater. A wide range of contaminants including aniline, PAHs, phenols, BTEX, and the metals arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc in groundwater, at sites adjacent to the Buffalo River, have concentrations in exceedance of New York State groundwater quality standards (Class GA; 6 NYCRR Part 701), drinking water Maximum Contaminant Levels (10 NYCRR, Subpart 5-1), or guidance values (IEc 2014). In addition, investigative reports indicate there is an exchange of water between the shallow groundwater at the selected sites and the Buffalo River (Turnkey 1998, Malcolm Pirnie, Inc. 1989, Mactec 2010).

Reports and details on specific injuries within the Buffalo River assessment area can be found at <https://www.fws.gov/northeast/nyfo/ec/buffalo.htm>. Additional information on surface water resources injured, including sediment, can be found at NYSDEC's Buffalo River Restoration Project website <http://www.dec.ny.gov/chemical/54166.html>. Data on potential injury and service losses to resources in the Times Beach Nature Preserve are limited. As sediment from the Buffalo River was deposited in the Times Beach Nature Preserve, injury and service losses to the aquatic habitat in the Times Beach Nature Preserve are assumed to be similar to service losses incurred in the Buffalo River.

#### *Cultural Resource Losses*

Cultural use of the Buffalo River natural resources has been injured by releases of hazardous substances. Haudenosaunee People depended on the aquatic systems of the Buffalo-Niagara River watershed as a food, agricultural, medicinal, ceremonial, transportation, and recreational resource, to name a few, until development, loss of access, and toxic contamination of the aquatic natural resources. In addition, Haudenosaunee language fluency suffers when natural resources are absent from the culture due to loss of language connection to the natural resources. Survival of the Tuscarora culture and language is intimately intertwined with the health of the land, air, water, fish, wildlife, plants, medicines, trees, and the ecosystem as a whole. Through the restoration of natural resources at the site, the Tuscarora Nation hopes that it will once again become a place for Haudenosaunee People to swim, fish, canoe, gather, play, and learn. Through the restoration of cultural resources at the site, the Tuscarora Nation hopes that cultural sites will be better protected and that there will be greater public knowledge about the Haudenosaunee historical and cultural resources located along the Buffalo River.

#### *Recreational Use Losses*

The Buffalo River, City Ship Canal, navigable waterways, and Times Beach Nature Preserve serve as unique local recreational resources utilized by the public. Current recreational uses include boating (e.g., canoeing, kayaking, paddle boarding, and power boating), recreational fishing, aesthetic appreciation/wildlife viewing, and swimming. To varying extents, the presence of contaminants has impaired all of these activities. Recreational fishing along the Buffalo River and City Ship Canal has been negatively impacted by releases of hazardous substances and the resulting issuance of fish consumption advisories. The presence of fish consumption advisories constitutes an injury under the DOI regulations, “[a]n injury to a biological resource has resulted from the discharge of oil or release of a hazardous substance if the concentration of the substance is sufficient to: ...[e]xceed levels for which an appropriate State health agency has issued directives to limit or ban consumption of such organism” (43 CFR §11.62 (f)(1)(iii)).

The fish consumption advisories have caused a loss in the value the public holds for participating in a fishing trip to the Buffalo River and injury was quantified for this recreational use. As noted in the Trustees 2011 Buffalo River Natural Resource Damage Assessment Fish Consumption Advisory Injury Determination Report (IEc 2011), the New York State Department of Health (NYSDOH) has issued annual fish consumption advisories for the Buffalo River since 1984 through present day due to the contamination of fish tissue with PCBs in excess of the U.S. Food and Drug Administration tolerance level of 2.0 parts per million wet weight in the edible tissue of fish (NYSDOH 1984a, 1984b; 21 CFR § 109.30). In addition to the PCB-driven component

of the advisories, fish consumption advisories also include a general provision on not consuming fish with visible abnormalities, including deformities, tumors, and lesions.

### *Restoration Project Scoping and Public Participation*

Based on the above injuries and losses quantified for the natural resources of the Buffalo River, City Ship Canal, and Times Beach Nature Preserve, the Trustees began scoping potential restoration projects that would restore, rehabilitate, replace, and/or acquire the equivalent of natural resources injured, destroyed, or lost as a result of the release of hazardous substances and oil. The Trustees have determined that equivalent habitat for injured Buffalo River, City Ship Canal, and Times Beach Nature Preserve natural resources includes stream, wetland, riparian, and adjacent upland habitat along the Buffalo River. As noted above in Section A, CERCLA requires that before settlement monies can be used for restoration activities, the Trustees must develop and adopt a restoration plan and provide for adequate public notice, opportunity for hearing, and consideration of all public comments.

On December 8, 2017, the Trustees issued a NOI to prepare a Draft RP/EA for the Buffalo River. Within the NOI, the Trustees requested public input to identify specific restoration project ideas in order to assist the Trustees in the development of the Draft RP/EA. The NOI outlined the criteria and guidance the Trustees would use in selecting, with public input, specific feasible restoration projects that would maximize the benefits to the affected resources in the Buffalo River. [https://www.fws.gov/northeast/nyfo/ec/files/buffaloriver/NOI\\_to\\_prepare\\_BR\\_RPEA\\_12-8-17.pdf](https://www.fws.gov/northeast/nyfo/ec/files/buffaloriver/NOI_to_prepare_BR_RPEA_12-8-17.pdf) The Trustees sent the NOI to multiple parties, including the Buffalo River Area of Concern Remedial Action Committee, Buffalo Niagara Waterkeeper, the Haudenosaunee Environmental Task Force, the City of Buffalo, Erie County, Niagara County Soil and Water Conservation District, University of Buffalo, Buffalo State - State University of New York, the Buffalo Audubon Society, The Nature Conservancy, the Western New York Land Conservancy, Trout Unlimited, Ecology and Environment, and other Federal entities including U.S. Geological Survey. The NOI was published in The Buffalo News on December 8, 2017, added to the Trustees' websites, and distributed by listserv(s).

## **E. Proposed Restoration**

### **1. Criteria for Evaluating Restoration Projects**

#### *1.1 NRDAR Criteria*

In developing the RP/EA, the Trustees are required to consider a reasonable number of possible restoration alternatives (43 CFR, §11.81, DOI NRDAR Regulations). This section of the Draft RP/EA explains the considerations and criteria for identifying and evaluating restoration alternatives, followed by descriptions of the proposed and preferred restoration alternatives.

According to the guidance provided by DOI NRDAR regulations, 43 CFR Part 11.82(d), the selected restoration alternative is to be feasible, safe, cost-effective, address injured natural resources, consider actual and anticipated conditions, have a reasonable likelihood of success, and be consistent with applicable laws and policies. The selected restoration actions also must not conflict with the ongoing cleanup projects at the site.

Restoration actions need to restore, replace, or acquire the equivalent of the natural resources injured and the natural resource services lost as a result of the releases of hazardous substances. To determine the best restoration alternative, each restoration alternative and proposed restoration project were evaluated for the relative ability to meet applicable criteria. The Trustees evaluated the alternatives to determine if those alternatives provided sufficient type, quality, and quantity of services to compensate for the loss based on site specific and regulatory criteria. The exact site-specific criteria to consider may vary depending on the unique circumstances and characteristics present. The Buffalo River Draft RP/EA criteria include:

1. Resource or service improved – The alternatives that provide improvement to the resource or service most similar to the injured resource or service are generally preferred.
2. Nexus to injury – The alternatives that replace similar resources closer to the location of the injury should be given priority. Projects that have no link in watershed, geographic area, species population, or affected user group to the injured resource should not be carried further in the assessment.
3. Feasibility – For each alternative, consideration should be given to technological, administrative, legal, and regulatory constraints. Projects that are not feasible or do not meet minimal legal requirements (including limitations set by the settlement) should be removed from further consideration.
4. Relative cost – Sufficient cost analysis should be done to provide a general estimate of cost for each alternative. Match opportunities should be described. Projects that can have a greater effect through leveraging with matching funds should be noted. Cost analysis should include consideration of costs to maintain and monitor project success.
5. Likelihood of success – The likelihood of success may include a number of considerations that may vary with alternatives and specific projects as determined by project objectives and methodologies, land protection, and maintenance. Projects that use experimental or innovative techniques may have a lower likelihood of success than those that use standard techniques. The likelihood of success for each project should be described.
6. Other Criteria – e.g. Site-Specific Criteria – Additional site-specific criteria can include: permanency of project benefits, time for project benefits to be achieved, contribution to resource management goals, public support, or the relationship between remedial actions and the injured resources. Site-specific criteria are discussed below.

## 1.2 Site-Specific Criteria

In order to ensure the appropriateness and acceptability of restoration options addressing losses to the Buffalo River, the Trustees evaluated each restoration alternative against site-specific restoration criteria. These site-specific criteria (Exhibit 2) were developed through discussions with natural resource managers at each of the Trustee agencies. These criteria include:

### **Exhibit 2. Buffalo River Site Specific Criteria**

- Location within the Buffalo River (Buffalo River, followed by the Buffalo River upstream tributaries, are given a higher priority over other locations within the Buffalo River watershed).
- Linkage to injured resources or associated services.
- Habitat connectivity (e.g., result is larger individual habitat parcels rather than multiple, smaller, disconnected parcels).
- Proximity to lands with protected status.
- Benefits to native and recreational fish species and habitat.
- Benefits to native bird species and habitat.
- Benefits to protected species, sensitive, or unique habitats.
- Public enjoyment or use of natural resources.
- Viability and sustainability of project.
- Part of larger local or regional conservation plan or vision, such as the plans referenced in Section C (Exhibit 1) above including, but not limited to, the City of Buffalo's Local Waterfront Revitalization Program (City of Buffalo 2017), Regional Niagara River/Lake Erie Watershed Management Plan (Buffalo Niagara Riverkeeper and NYS Department of State 2017), or other plans.

## 2. Restoration Categories and Project Ideas Considered

### 2.1 Proposed Restoration Categories

The Trustees considered a broad set of restoration projects that could potentially improve ecological and public use services relevant to the assessment area. During Trustee restoration project evaluation, the Trustees gave consideration to the Regional Niagara River/Lake Erie Watershed Management Plan (Buffalo Niagara Riverkeeper and NYS Department of State 2017) in prioritizing restoration categories and projects and areas for restoration within the Buffalo River. In addition to restoration projects proposed by Trustee agencies, restoration project ideas within restoration categories were solicited from the public through a NOI to prepare a Draft RP/EA. The proposed restoration categories considered by the Trustees are noted in Exhibit 3:

### **Exhibit 3. Proposed Restoration Categories**

Instream and Stream Bank Enhancement/Restoration  
Wetland Enhancement/Restoration  
Upland Enhancement/Restoration  
Fisheries Enhancement/Restoration  
Amphibian and Reptile Enhancement and/or Restoration  
Avian Enhancement/Restoration  
Submerged Aquatic Vegetation Restoration  
Land Acquisition/Preservation  
Natural Resource-Based Public Use Enhancement

### *2.2 Restoration Project Ideas Received and Considered*

Restoration project ideas received and considered through the NOI to prepare a Draft RP/EA and request for project ideas and public comment period included (Exhibit 4, Figures 3a, b):

### **Exhibit 4. Restoration Project Ideas Received Through Public Notice and Comment**

Long term stewardship and maintenance funds for recently completed and future restoration projects including invasive species control

Niagara Frontier Transit Authority shoreline property acquisition and riparian and recreational restoration

Habitat connectivity and corridor enhancements including instream, riparian, wetland, and upland restoration projects along the Buffalo River, its tributaries, and the City Ship Canal at the following locations:

- |  |  |
|--|--|
| - Upland areas adjacent to the City Ship<br>Canal and Ohio Street Bridge | - Channelized section of Cazenovia Creek |
| - Katherine Street Peninsula shoreline                                   | - Property adjacent to Old Bailey Woods  |
| - Silo City  | - Houghton Park                          |
| - Concrete Central Peninsula   | - South Buffalo Charter School           |
|  | - Harlem Road Boat Launch                |

Emerling Forest preservation and restoration

Buffalo Blueway Public Access - project implementation of public access sites along the Buffalo River

Buffalo Color Peninsula Public Use restoration

Development of a public access and human connectivity plan for the Buffalo River

Linear park and multi-use trail creation adjacent to the Buffalo River

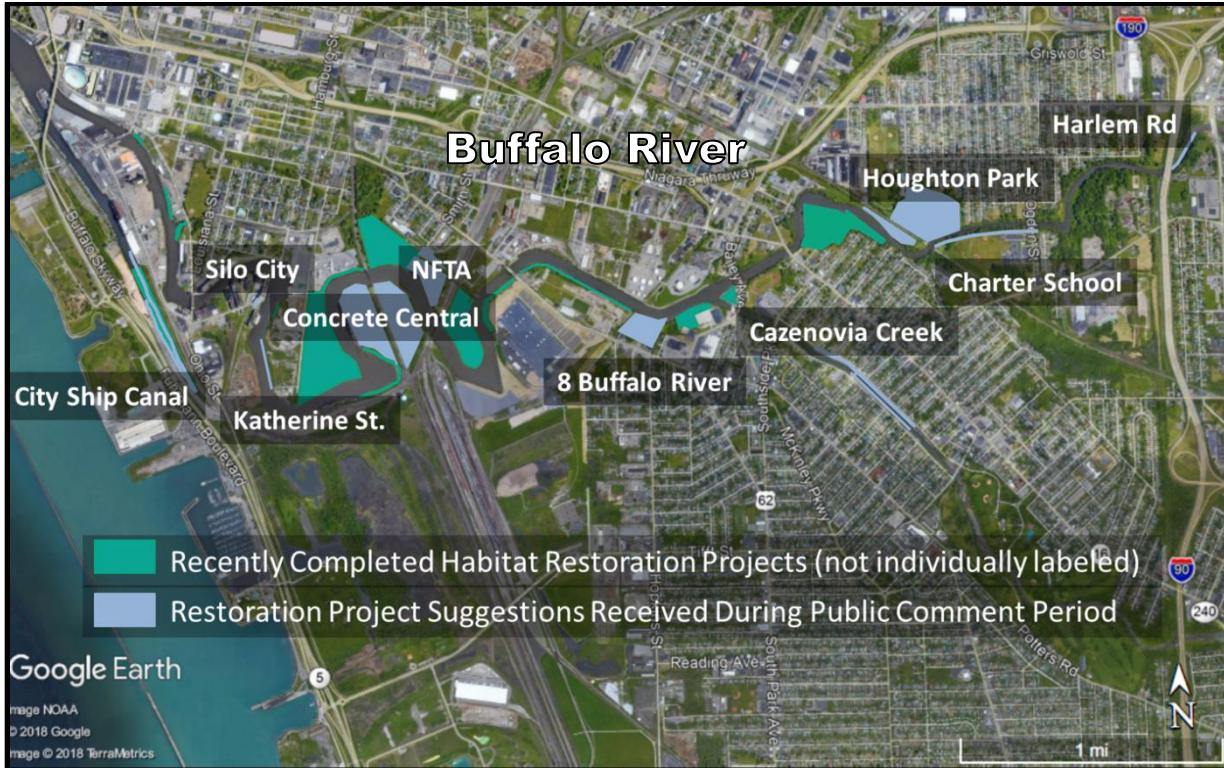


Figure 3a. Buffalo River, New York, NRDAR Habitat Restoration Project Suggestions Received During Public Comment Period

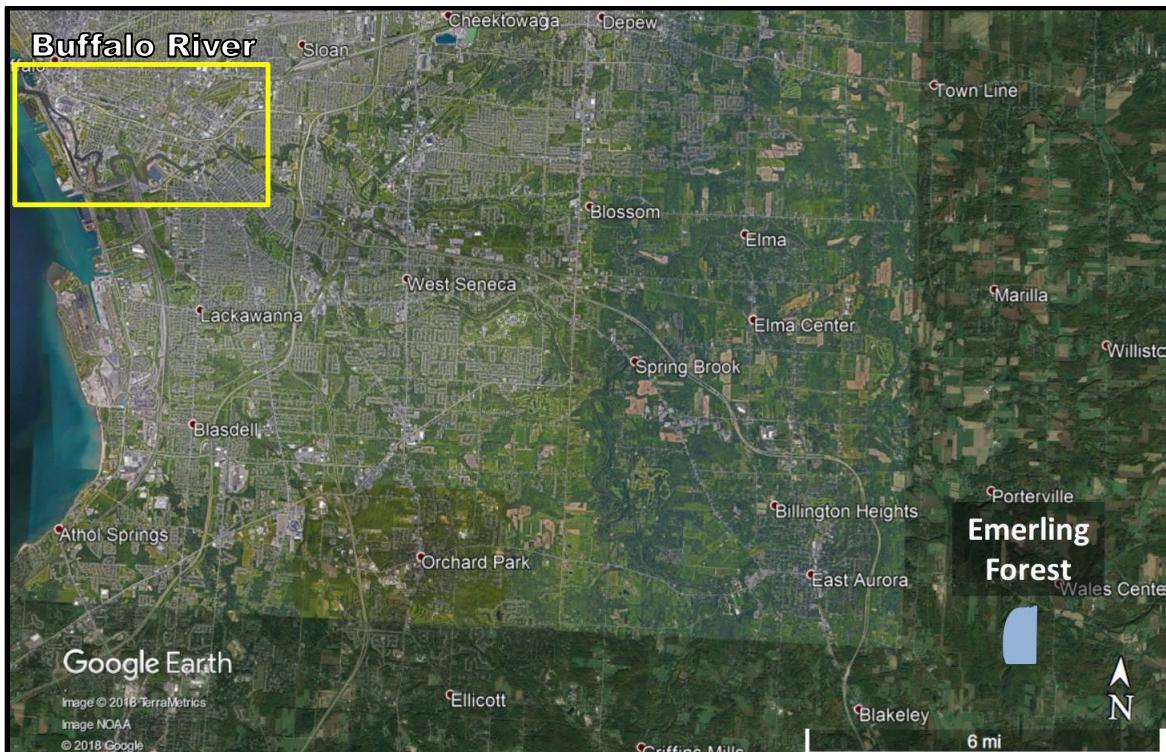


Figure 3b. Buffalo River, New York, NRDAR Emerling Forest Habitat Restoration Project Suggestion Received During Public Comment Period

The Trustees reviewed the proposed projects (Exhibit 4) against the NRDAR and Site Specific Criteria. In addition, the Trustees reviewed existing plans and data related to the received projects in order to determine the projects that would maximize the benefits to the affected resources in the Buffalo River.

### *2.3 Restoration Project Ideas Considered But Not Further Evaluated*

There were several restoration project ideas that the Trustees explored but chose not to pursue based on the NRDAR and Site Specific Criteria of technical feasibility, likelihood of success, benefits to the ecosystem, connection to the injured natural resources, habitat connectivity, and cost effectiveness, including the following:

- Katherine Street Peninsula shoreline restoration
- Property adjacent to Old Bailey Woods
- Harlem Road Boat Launch
- Buffalo Color Peninsula Public Use
- Buffalo Blueway Public Access

In the case of the Katherine Street Peninsula shoreline restoration and the property adjacent to Old Bailey Woods restoration project ideas, the Trustees determined to prioritize projects that protected properties in perpetuity, maximized the amount of habitat that was protected and enhanced or restored, and, therefore, more completely satisfied the NRDAR and Site Specific Criteria. The Katherine Street Peninsula project would involve multiple landowners, reducing project feasibility and likelihood of success, and would be limited to primarily stream bank restoration along approximately 1,000 feet of shoreline and, therefore, would not fully satisfy the benefits to the ecosystem, habitat connectivity, and cost effectiveness criteria. Similarly, the property adjacent to Old Bailey Woods, while not involving multiple landowners, would be limited to enhancement of approximately 630 feet of stream bank and upland habitat restoration not exceeding 4.5 acres.

With respect to the Harlem Road Boat Launch, Buffalo Color Peninsula Public Use, and Buffalo Blueway Public Access projects, the Trustees have determined not to select a specific natural resource-based public use project at this time, but will continue to evaluate potential restoration projects. The Trustees will coordinate with local partners related to all planned and ongoing initiatives, which are currently in the planning and design phases, such as the Buffalo Blueway Public Access projects in order to maximize restoration opportunities within the Buffalo River. Trustee coordination during Buffalo Blueway design development will allow for a specific Natural Resource-based Public Use project to more fully align with the NRDAR and Site Specific Criteria of cost effectiveness, connection to the injured natural resources, public enjoyment or use of natural resources, technical feasibility, and likelihood of success.

### **3. Proposed Restoration Alternatives**

Based on the NRDAR and Site Specific Criteria (Section E.1.) of technical feasibility, likelihood of success, benefits to the ecosystem, connection to the injured natural resources, habitat connectivity, and cost effectiveness, the Trustees determined that they would explore and analyze in detail three alternatives in the Draft RP/EA (Tables 2 and 3).

#### *3.1 Alternative 1 (Preferred Alternative)*

The Trustees preferred restoration alternative, presented in Table 2, is implementation of a suite of restoration projects from the below restoration categories (Exhibit 5) that compensate for losses and satisfy the site-specific and regulatory criteria. The Trustees may implement restoration projects from restoration categories that are not specifically identified in this Draft RP/EA, but are similar to those restoration categories identified and consistent with our restoration requirement under CERCLA to use settlement funds to compensate the public by restoring injured natural resources and supporting habitat, and/or services provided by the injured resources. The need to implement restoration projects beyond the RP/EA preferred restoration alternative may arise from: 1) the inability to achieve restoration goals by implementing projects solely within identified categories, or 2) a determination that a future action and/or project outside of the identified categories is more appropriate at meeting restoration goals based on application of the site-specific and regulatory criteria, as noted above in Section E.1. In the event of a significant modification to the RP/EA, the Trustees will provide the public with an opportunity to comment on that particular modification and will be finalized before any modifications will be implemented. The preferred restoration alternative includes projects from the following restoration categories:

#### **Exhibit 5. Preferred Restoration Alternative Categories**

- Instream and Stream Bank Enhancement/Restoration
- Wetland Enhancement/Restoration
- Upland Enhancement/Restoration
- Fisheries Enhancement/Restoration
- Amphibian and Reptile Enhancement and/or Restoration
- Avian Enhancement/Restoration
- Land Acquisition/Preservation
- Natural Resource-Based Public Use Enhancement

Descriptions of Trustee proposed restoration work for each restoration category are provided below:

- Instream and Stream Bank Enhancement/Restoration Work Description

Instream restoration consists of restoring the functional relationships between stream dimension, pattern, and profile to create a natural stable channel. Stream bank restoration consists of enhancing riparian buffers along shorelines and tributaries. Proposed restoration work may include debris removal of items such as tires and trash, establishing/enhancing riparian buffers, fencing, natural channel design, and/or revegetation.

- Wetland Enhancement/Restoration Work Description

Wetland enhancement and restoration consists of improving and restoring wetlands along the shorelines of the Buffalo River and its tributaries. Proposed restoration work may include debris removal of items such as tires and trash, and methods to restore wetland hydrology, natural habitat patchiness, and topographic and vegetative complexity, including invasive species control.

- Upland Enhancement/Restoration Work Description

Upland restoration consists of enhancing grassland and forested habitat along the banks of the Buffalo River and tributaries. Proposed restoration actions may include fencing, site preparation (may include cutting, plowing, disking, herbicide treatment), native vegetation planting, and post-planting mowing (schedule, frequency).

- Fisheries Enhancement/Restoration Work Description

Fisheries enhancement and restoration may include creation of, enhancement of (including debris removal of items such as tires and trash), or access to spawning or nursery habitat for various species (e.g., recreational fish species, northern pike, and lake sturgeon); selective restocking; and improvements to fish passage (e.g., dam removal, fish passage, tributary culvert improvements).

- Amphibian and Reptile Enhancement/Restoration Work Description

Amphibian and reptile enhancement and restoration may include creation of, enhancement of (including debris removal of items such as tires and trash), or access to habitat, based on specific species requirements.

- Avian Enhancement/Restoration Work Description

Avian enhancement and restoration consists of habitat protection, enhancement, and/or restoration for native birds species and might include perching or nesting platforms for species such as osprey, predator control for ground nesting species, or restoration of native shrub habitat for species such as American woodcock (*Scolopax minor*) and brown thrasher (*Toxostoma rufum*).

- Land Acquisition/Preservation Work Description

Land acquisition or conservation restrictions for wetland, riparian, and upland restoration is proposed in and around the City of Buffalo, along the Buffalo River, (Erie County) and would be held in perpetuity for the benefit of the public.

- Natural Resource-Based Public Use Enhancement Work Description

Natural resource-based public use enhancement projects may include improvements or creation of recreational opportunities along the Buffalo River including access to the river (e.g., trails, bridges, and boardwalks), shore and boat fishing access to the Buffalo River. Environmental natural resource educational and outreach projects that are a component of natural resource restoration projects and/or enhance the benefits of the restored natural resources may also be appropriate.

The Trustees have identified and incorporated into the Draft RP/EA specific restoration projects to be implemented from within the above restoration categories. All of the restoration projects are described below and are presented in the priority order that the Trustees propose to implement them, at this time, should funding become available for such work (Table 2). Depending on the settlement outcome, this prioritization is subject to change, at the Trustees discretion, should the Trustees evaluation of the relevant factors change.

**Table 2. Preferred Alternative Restoration Projects**

Preferred Restoration Project	Preferred Restoration Project Categories							
	Instream/ Stream bank	Wetland	Upland	Avian	Fisheries	Herptile	Land Acquisition/ Preservation	Natural Resource-Based Public Use
<b>Concrete Central Peninsula</b>	X	X	X	X	X	X	X	
<b>City Ship Canal</b>	X		X	X		X	X	X
<b>Houghton Park and Upstream Parcels</b>	X	X	X	X	X	X	X	X
<b>Funding for Natural Resource-Based Public Use</b>					To be determined			X
<b>Buffalo River Watershed Invasive Species Management</b>	X	X	X	X	X	X		
<b>South Buffalo Charter School</b>	X				X	X	X	X
<b>Niagara Frontier Transit Authority</b>		X	X	X		X	X	
<b>Silo City</b>	X	X		X	X	X	X	X

<b>Table 3. Evaluation of Alternatives Against the NRDAR and Site Specific Criteria (Section E.1.)</b>									
	Prioritized Location within Buffalo River	Linkage to injured Resources or Services	Habitat Connectivity	Proximity to lands with protected status	Benefits to native species/protected species/unique habitat	Public enjoyment/use of natural resources	Viability and sustainability of project	Part of a local or regional restoration plan	Relative Cost
<i>Preferred Alternative (1)</i>									
Concrete Central Peninsula	X	X	X	X	X		X	X	X
City Ship Canal	X	X	X	X	X	X	X	X	X
Houghton Park and Upstream Parcels	X		X	X	X	X	X	X	X
Funding for Natural Resource-Based Public Use	X	X				X	X		
Buffalo River Watershed Invasive Species Management	X				X		X	X	X
South Buffalo Charter School	X	X	X	X	X	X	X	X	X
Niagara Frontier Transit Authority	X	X	X	X	X	X	X	X	X
Silo City	X	X			X	X	X		X
<i>Alternative 2</i>									
Emerling Forest			X	X	X		X		
Channelized section of Cazenovia Creek					X		X	X	
Buffalo River public access and human connectivity plan	X					X		X	
Linear park and multi-use trail adjacent to Buffalo River	X					X		X	
<i>Alternative 3 – No Action</i>	-	-	-	-	-	-	-	-	-

Preferred Alternative Prioritized Restoration Projects:

*3.1.1. Concrete Central Peninsula Conservation Easement and Restoration*



**Concrete Central Peninsula**

The Trustees support the preservation and restoration of the Concrete Central Peninsula property. The Concrete Central Peninsula property is approximately 45 acres along the south shore of the Buffalo River, approximately 3.2 miles from the mouth of the river, and is directly across the river from Red Jacket River Front Park (Figures 2, 3a, and 4).

Preservation of this property would establish and protect a habitat corridor between the Tifft Nature Preserve, which adjoins the Concrete Central Peninsula property to the south and west, and Red Jacket River Front Park on the north shore of the Buffalo River. Habitat corridors between remaining and restored fragments of habitat can link areas of a variety of habitats



Figure 4. Concrete Central Peninsula Conservation Easement and Restoration

such as instream, mudflat, wetland, riparian edge, floodplain, and uplands. The Trustees recommended habitat restoration work includes stream bank, wetland, grassland/upland enhancement and restoration, including removal of invasive plant species and planting of native species. The aforementioned habitat restoration work would benefit avian, fisheries, and amphibian and reptile populations. A conservation easement and restriction would be recorded on the real property to preserve the restoration work in perpetuity.

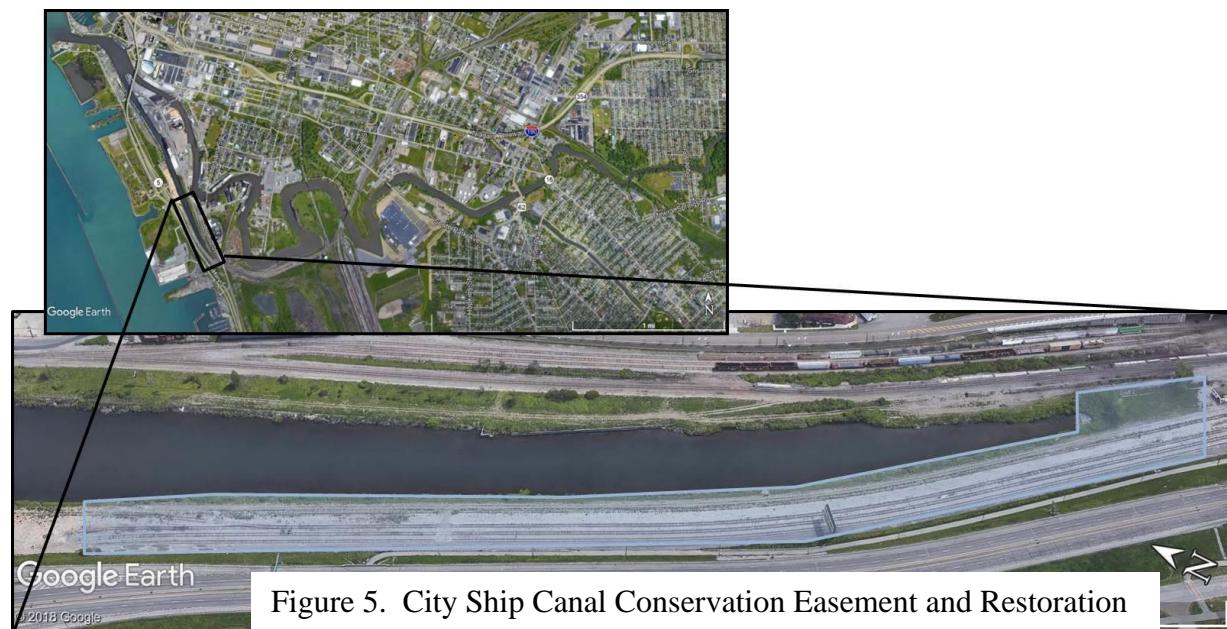
### *3.1.2 City Ship Canal Conservation Easement and Restoration*

The Trustees support the preservation and restoration of the riparian and upland property along the southern end of the City Ship Canal. The City Ship Canal, located to the west of the Buffalo River, forms a spur of aquatic habitat that stretches approximately 1.4 miles from the mouth of the Buffalo River south to the Tifft Nature Preserve (Figure 5). Preservation of this property would enhance the habitat restoration that was recently completed under the GLLA remedy. The habitat

restoration work includes stream bank, riparian edge, and upland restoration, including removal of invasive plant species and planting of native species. The aforementioned habitat restoration



**City Ship Canal**



**Figure 5. City Ship Canal Conservation Easement and Restoration**

work would benefit avian, fisheries, amphibian, and reptile populations. In addition, the Trustees are proposing public access, cartop boat launch, and fishing at the City Ship Canal that would link the City Ship Canal to the existing Outer Harbor and Greenway Trail. A conservation easement and restriction would be recorded on the real property to preserve the restoration work in perpetuity.

### *3.1.3 Houghton Park and Upstream City of Buffalo Parcels Conservation Easement and Restoration*

The Trustees support the preservation and restoration of the undeveloped portion of Houghton Park and Upstream City of Buffalo Parcels. The undeveloped portion of Houghton Park is approximately 22 acres located to the east of the developed portion of Houghton Park, along the north bank of the Buffalo River approximately 7.2 miles from the mouth of the river (Figure 6). The Upstream City of Buffalo Parcels consist of undeveloped parcels along the north bank of the Buffalo River, east of the undeveloped portion of Houghton Park, from approximately Water Street to South Pierce Street (Figure 6).



Houghton Park

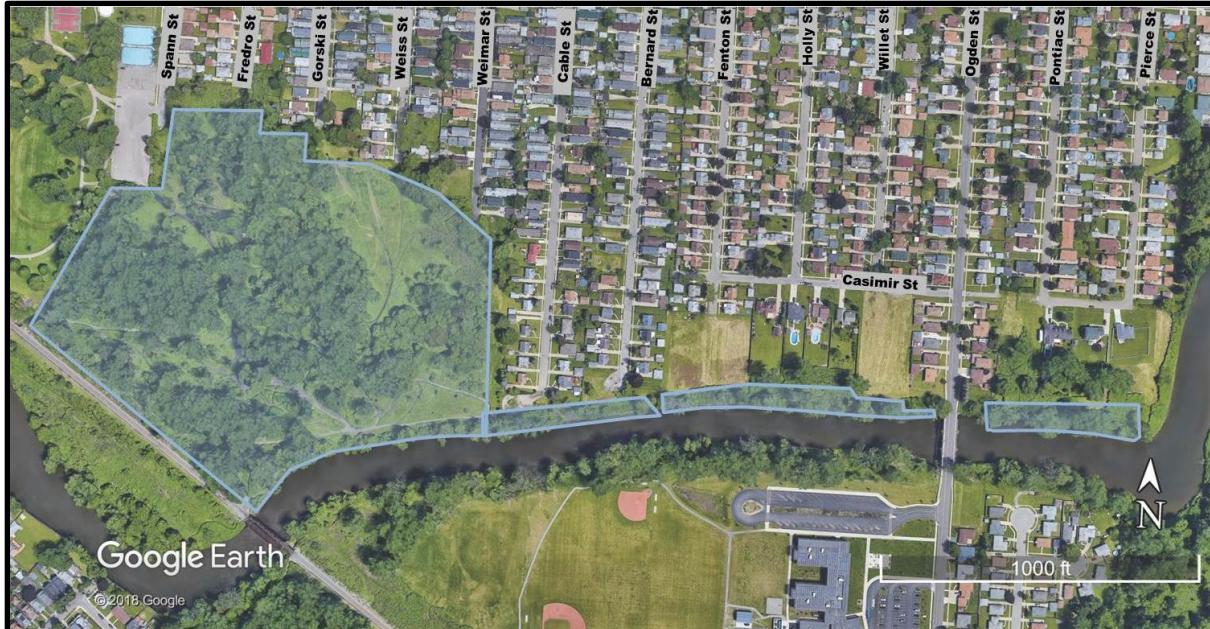


Figure 6. Houghton Park and Upstream City of Buffalo Parcels Conservation Easement and Restoration

Preservation of these properties would enhance the habitat corridor from South Pierce Street to the downstream Seneca Bluffs habitat restoration project, located on the southern bank of the River. The Trustees will work with the City of Buffalo to design sustainable habitat and recreational restoration options for the undeveloped portion of Houghton Park that will enhance



**Upstream City Parcels**

the existing setting for wildlife and the public. Proposed habitat restoration options for the undeveloped portion of Houghton Park include stream bank, wetland, and upland restoration, including invasive plant species management as well as measures to restrict illegal access by motorized off road vehicle use. The aforementioned habitat restoration work would benefit avian, fisheries, amphibian, and reptile populations. The Trustees are also proposing to enhance the public use of the undeveloped portion of Houghton Park with a sustainable earthen trail to allow for greater use by walkers, runners, bird and wildlife watchers, and school groups. For the Upstream City of Buffalo Parcels, the Trustees support invasive species management and limited shoreline disturbance. A conservation easement and restriction would be recorded on the real property to preserve the restoration work in perpetuity.

### *3.1.4 Natural Resource-Based Public Use Enhancement*

The Trustees support increased public access and recreational use of the Buffalo River. As tourism, public use, and recreational access are now a major focus along the Buffalo River, the Trustees will work with local partners to determine the restoration projects that will maximize the benefits to the affected uses of the Buffalo River.

### *3.1.5 Buffalo River Watershed Invasive Plant Species Management*

Long-term invasive plant species management consisting of the removal of invasive plant species and the planting of native vegetation, over a time period of up to 20 years, within the Buffalo River watershed would allow for the continued success of the tremendous restoration efforts that have been implemented along the Buffalo River. Eligible projects for invasive species management funding would include completed habitat restoration projects conducted under the GLRI and GLLA and new areas identified within the watershed. Proposed invasive plant species management projects within the Buffalo River, followed by Buffalo River upstream tributaries, will be given a higher priority over other locations within the Buffalo River watershed (Figure 7). This prioritization is subject to change, in the Trustees sole discretion, should the Trustees evaluation of the relevant factors change. The Buffalo River Watershed Invasive Plant Species Management project is an effort to assist in addressing the need for long-term management and maintenance of restoration projects.

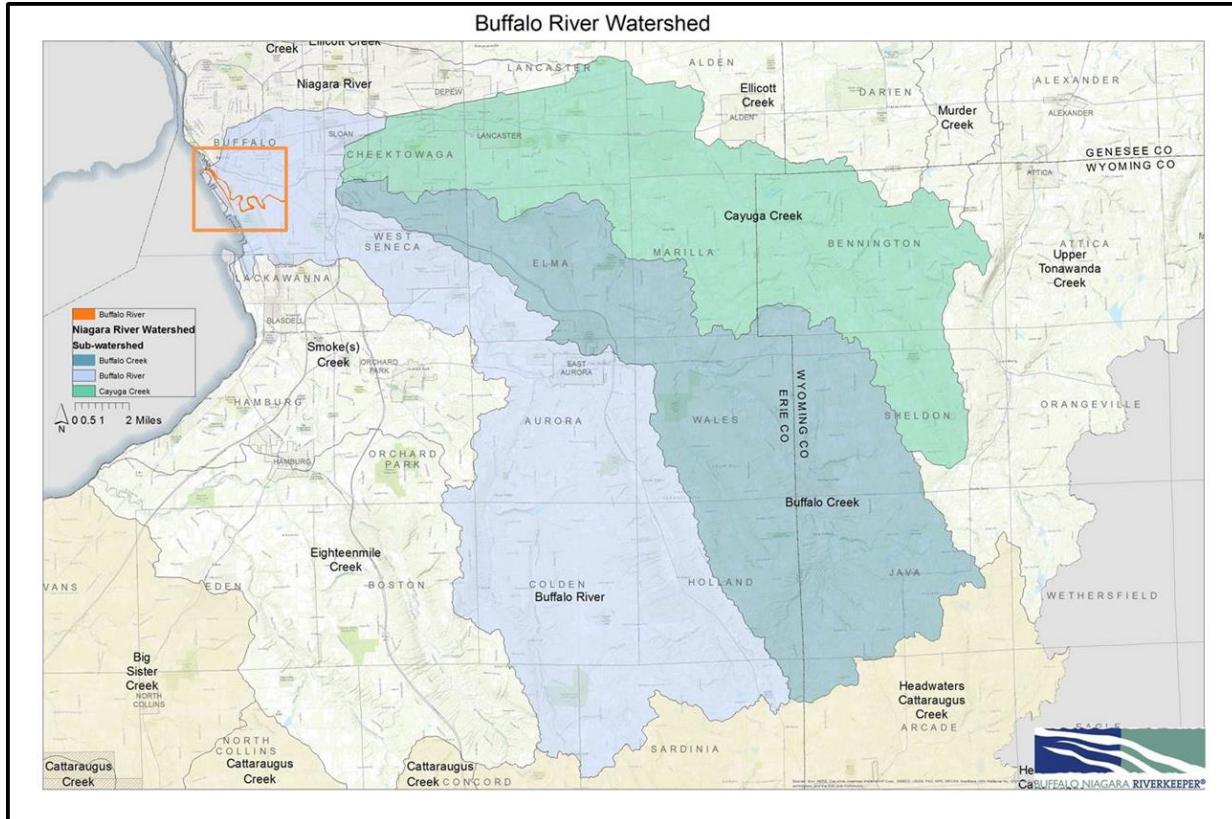


Figure 7. Buffalo River Watershed Invasive Plant Species Management. Figure from Buffalo Niagara Waterkeeper 2018.

### *3.1.6. South Buffalo Charter School Conservation Easement and Restoration*

Shoreline preservation of the South Buffalo Charter School property, on the south bank of the Buffalo River, adjacent and downstream of Houghton Park and the Seneca Bluffs restoration projects, would enhance the existing habitat corridor (Figure 8). Habitat restoration of the approximately 2,000 feet of shoreline would include invasive species control and planting of native vegetation. The restoration work would benefit avian, fisheries, amphibian, and reptile populations. In addition, the location provides an excellent opportunity for public outreach as an outdoor classroom.



Figure 8. South Buffalo Charter School Conservation Easement and Restoration

### *3.1.7 Niagara Frontier Transit Authority Easement and Restoration*

The Trustees support preservation and restoration of the approximate 14 acres of upland habitat of the Niagara Frontier Transit Authority property, located on the north bank of the Buffalo River, across the river from the Concrete Central Peninsula property (Figure 9). Habitat restoration within the upland portion of the property would include invasive species control and planting of native vegetation. The upland habitat restoration work would complement the recently completed GLRI restoration of 1,080 feet of shoreline. The restoration work would benefit avian, fisheries, amphibian, and reptile populations.



Figure 9. Niagara Frontier Transit Authority Easement and Restoration

### *3.1.8 Silo City Easement and Restoration*

The Trustees support preservation and restoration of shoreline habitat at the Silo City property. The Silo City property is located along the Buffalo River approximately 1.7 miles from the mouth of the river, within a section of the river that is dominated by historic grain elevators, bulkheads, and hardened shoreline (Figure 10). The habitat restoration includes stream bank restoration, including invasive species control and planting of native vegetation. The aforementioned habitat restoration would provide critical habitat for fish and wildlife moving up and downstream within the Buffalo River and would benefit avian, fisheries, amphibian, and reptile populations. In addition, this location may provide emergency egress for recreational users of the Buffalo River in a section with no exit or entry points.

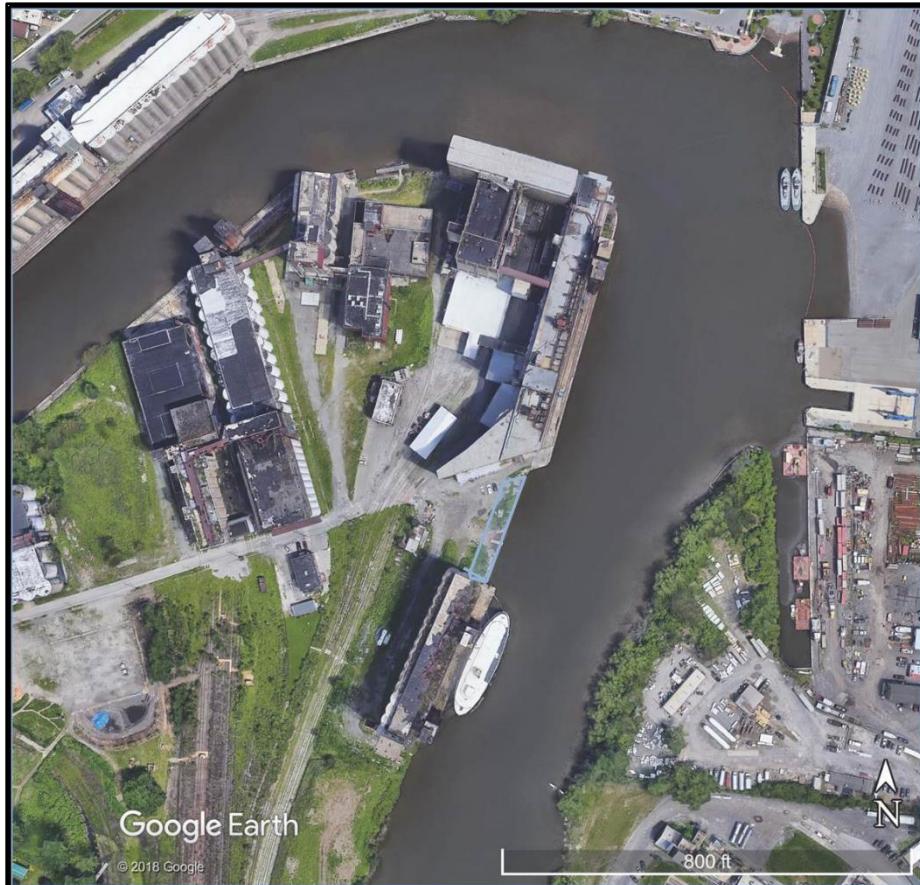


Figure 10. Silo City Easement and Restoration  
emergency egress for recreational users of the Buffalo River in a section with no exit or entry points.

### *3.2 Alternative 2 Upstream Forest Preservation, Cazenovia Creek Concrete Channel Restoration, and Public Use Planning and Design*

Alternative 2 consists of projects that did not fully compensate for losses and satisfy the site-specific and regulatory criteria listed in Section E.1 (Table 3).

#### *3.2.1. Emerling Forest Preservation and Restoration*

While preservation and restoration of Emerling Forest, a 222 acre headwater forest on Hunter's Creek, a tributary of Buffalo Creek, would preserve critical habitat for fish and wildlife, including preservation of water quality at the site and further downstream, the location of the project in Wales, New York, is approximately 20 miles from the head of the Buffalo River. Per the Site Specific Criteria noted in Section E.1, projects located within the Buffalo River are

given a higher priority over other locations within the Buffalo River watershed. In addition, due to the distance of the project from the Buffalo River, the Site Specific Criteria of public enjoyment or use of natural resources is not anticipated to be as high as public use projects located adjacent to the Buffalo River.

### *3.2.2. Channelized Section of Cazenovia Creek*

With regard to the channelized section of Cazenovia Creek, it is acknowledged that the concrete-lined flood control channel adversely impacts fish and wildlife habitat including instream, stream bank, and wetland habitat. However, restoration design and implementation costs are estimated to exceed the ecological benefits that the project would provide when compared to the ecological benefits of other larger restoration projects being considered. As costs are estimated to exceed the ecological benefit, restoration of the channelized section of Cazenovia Creek does not meet the NRDAR Criteria of Relative Cost noted in Section E.1.

### *3.2.3 Buffalo River Public Use Planning and Design*

While the proposed development of a public access and human connectivity plan for the Buffalo River is recommended for any area experiencing an economic resurgence, plan development is not an on-the-ground restoration project, when evaluated against the NRDAR Criteria of resource or service improved and the Site Specific Criteria of benefits to fish and wildlife and the public. Similarly, while the Trustees look forward to advancement of a plan to develop a linear park and multi-use trail adjacent to the Buffalo River, plan development is not an on-the-ground restoration project that provides benefits ranging from the timeframe of immediate to one to two construction seasons.

### *3.3 No Action Alternative*

As required under the National Environmental Policy Act (NEPA) and CERCLA NRDAR regulation at 43 CFR § 11.82(c)(2), the Trustees considered a restoration alternative of no action (Table 3). Under this alternative, the Trustees would rely on natural recovery and would take no direct action to restore injured natural resources or compensate for lost natural resource services. This alternative would include the continuance of ongoing monitoring programs, such as those initiated by NYSDEC for fish, but would not include additional activities aimed at enhancing ecosystem biota or processes. Under this alternative, the public would not be compensated for injuries to natural resources and losses of resource services. An alternative of no action does not satisfy the site-specific and regulatory criteria listed in Section E.1.

### *3.4 Environmental Benefits from Proposed Preferred Restoration Alternative*

Implementation of the proposed preferred restoration alternative is expected to generate long-term benefits to fish and wildlife resources that are substantially greater than any potential short-term adverse impacts that may occur during construction. For example, short-term impacts arising from the restoration categories, listed above and within the preferred restoration alternative, could include minor disruption of riverine and stream bank habitats during project implementation (e.g., stream bank enhancement activities may result in a decrease in vegetative

cover prior to restoration planting activities or a slight increase in soil runoff while fencing is installed).

#### **4. Compliance with Federal, State, and Local Laws and Policies**

Coordination and evaluation of required compliance with specific Federal acts, executive orders, and other policies for the preferred restoration alternative is achieved, in part, through the dissemination of this document to, and review by, appropriate agencies and the public. All restoration projects will be in compliance with all applicable Federal statutes, executive orders, and policies, including NEPA, 42 USC §§ 4321, *et seq.*; the Endangered Species Act, 16 USC §§ 1531, *et seq.*; the National Historic Preservation Act of 1966, 16 USC §§ 470, *et seq.*; the Fish and Wildlife Coordination Act, 16 USC §§§ 661, *et seq.*; the Rivers and Harbors Act of 1899, 33 USC § 403, *et seq.*; the Federal Water Pollution Control Act, 33 USC §§ 1251, *et seq.*; Executive Order 11990, Protection of Wetlands; Executive Order Number 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations; and Executive Order 11988, Flood Plain Management.

The Trustees believe that the preferred restoration alternative represents cost-effective, practical, and beneficial means by which to restore or replace the injured natural resources and the services they provided. Compliance with the laws cited above, and any necessary permitting, will be undertaken during the planning stages of specific restoration projects. NEPA requires that federal agencies determine whether or not their proposed actions will have a significant impact, including the consideration of cumulative impact, on the human environment. Activities proposed as part of the proposed preferred alternative qualify as a categorical exclusion under NEPA (40 CFR § 1508.4). They are a category of actions that do not individually or cumulatively have a significant effect on the human environment and are categorically excluded from the need to consider in either an Environmental Assessment or an Environmental Impact Statement unless a proposed action has extraordinary circumstances. Additional scoping and, as needed, additional NEPA analyses will be conducted for any restoration project that does not meet reasonable expectations of low environmental impact. Project-specific NEPA documents, based on this RP/EA, will be generated as needed and public notice provided. The Trustees will monitor restoration project activities to ensure that adverse impacts from project-specific actions are offset by project benefits to the physical, biological, socio-economic, and cultural environments.

#### **5. Monitoring and Site Protection**

The development of monitoring plans will be conducted for each restoration project that receives settlement funding. The specific performance criteria, monitoring period, frequency of monitoring, and associated reports will vary depending on the type of project, and will be determined on a case-by-case basis. Each restoration project will be maintained and protected for a length of time commensurate with the funding and project purpose. For example, the Trustees anticipate that wetland acquisition and restoration projects, as well as all other land acquisition projects, will be placed under a protective land covenant (e.g., conservation easement, deed restriction) in perpetuity. Restoration on publicly and privately owned land should be protected for a minimum of 15 years and potentially in perpetuity. Recreational

restoration projects should be protected for a minimum of 25 years and potentially in perpetuity. Lesser terms of maintenance and protection may be appropriate for other projects and will be determined on a case by case basis.

## **F. Conclusion**

After significant and meaningful input from the public, local communities, and other interested stakeholders, State and Federal stream and wetland restoration experts, and restoration project proponents, and after evaluating and considering the proposed restoration alternatives under the CERCLA NRDAR regulations and all other relevant State and Federal laws and policies, the Trustees have proposed their Preferred Alternative. The Trustees proposed preferred restoration alternative is implementation of a suite of restoration projects that compensate for losses and satisfy the site-specific and regulatory criteria from the following restoration categories: instream and stream bank, wetland, and upland enhancement and restoration, land preservation, and natural resource-based public use enhancement. The preferred alternative restoration projects include: conservation easement and restoration at Concrete Central Peninsula, City Ship Canal, and Houghton Park, natural resource-based public use enhancement, Buffalo River Watershed invasive plant species management, conservation easement and restoration at South Buffalo Charter School, Niagara Frontier Transit Authority, and Silo City. The restoration projects are presented in the priority order that the Trustees propose to implement them, at this time, should funding become available for such work (Table 2). Depending on the settlement outcome, this prioritization is subject to change, at the Trustees discretion, should the Trustees evaluation of the relevant factors change.

The Trustees may implement restoration projects from restoration categories that are not specifically identified in this RP/EA, but are similar to those restoration categories identified and consistent with our restoration requirement under CERCLA to use settlement funds to compensate the public by restoring injured natural resources and supporting habitat, and/or services provided by the injured resources. The need to implement restoration projects beyond the RP/EA preferred restoration alternative may arise from: 1) the inability to achieve restoration goals by implementing projects solely within identified categories; or 2) a determination that a future action and/or project outside of the identified categories is more appropriate at meeting restoration goals based on application of the site-specific and regulatory criteria, as noted above in Section E.1. In the event of a significant modification to the RP/EA, the Trustees will provide the public with an opportunity to comment on that particular modification and will be finalized before any modification will be implemented.

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**Buffalo River Restoration Plan and Environmental Assessment Approval  
Buffalo River, Buffalo, New York**

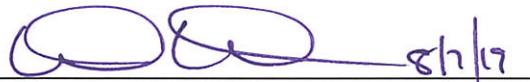
In accordance with the U.S. Department of the Interior (DOI) policy regarding documentation for natural resource damage assessment and restoration projects (521 DM 3), the Authorized Official for the DOI must demonstrate approval of draft and final Restoration Plans and their associated National Environmental Policy Act documentation, with concurrence from the DOI Office of the Solicitor.

The DOI Authorized Official for the Buffalo River, Erie County, New York, natural resource damage assessment case is the Regional Director for the U.S. Fish and Wildlife Service's Northeast Region. The State of New York Authorized Official for the Buffalo River, Erie County, New York, natural resource damage assessment case is the Deputy Commissioner for the New York State Department of Environmental Conservation. The Tuscarora Nation Authorized Official for the Buffalo River, Erie County, New York, natural resource damage assessment case is Chief Leo Henry.

By the signatures below, the attached Draft Restoration Plan and Environmental Assessment for the Buffalo River, Buffalo New York, is hereby approved.

Approved:

Concurred:

	8/1/19	
Wendi Weber Regional Director Northeast Region U.S. Fish and Wildlife Service	Date	Kimberly Gilmore Senior Attorney Northeast Region Office of the Solicitor
		Date

Approved:

Thomas S. Berkman Deputy Commissioner and General Counsel New York State Department of Environmental Conservation	Date
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Approved:

Concurred:

Chief Leo Henry Tuscarora Nation	Date	Adam Stolorow Attorney for the Tuscarora Nation Sive, Paget & Riesel P.C.	Date
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**Buffalo River Restoration Plan and Environmental Assessment Approval  
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Concurred:

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Wendi Weber  
Regional Director  
Northeast Region  
U.S. Fish and Wildlife Service

Date

Kimberly Gilmore  
Staff Attorney  
Northeast Region  
Office of the Solicitor

Date

*K. Gilmore*      *8/28/19*

Approved:

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Thomas S. Berkman  
Deputy Commissioner and General Counsel  
New York State Department of Environmental Conservation

Concurred:

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Chief Leo Henry  
Tuscarora Nation

Date

Adam Stolorow  
Attorney for the Tuscarora Nation  
Sive, Paget & Riesel P.C.

Date

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Thomas S. Berkman Deputy Commissioner and General Counsel New York State Department of Environmental Conservation	Date
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